

Fig. 7. A cirriferous parapodium of the right side drawn from behind (enlarged).

Fig. 8. An elytriferous parapodium drawn from above (enlarged).

Lettering of figs. 7, 8:—

<i>ac.</i> , acicula.	<i>m.d.c.</i> , median dorsal respiratory channel.
<i>br.</i> , branchiæ.	<i>neph.</i> , nephridial papilla.
<i>ch.</i> , neuropodial chæta.	<i>nr.</i> , neuropodium.
<i>cl.</i> , elytrephore.	<i>nr.c.</i> , neuropodial cirrus.
<i>f.</i> , notopodial bunch of hair.	<i>nt.</i> , notopodium.
<i>f.p.r.</i> , flattened parapodial ridge.	<i>nt.c.</i> , base of notopodial cirrus.

PLATE LXII.

Fig. 9. The part of fig. 6, much magnified.

Fig. 10. Large typical elytron from the middle of the left side. $\times 2$.

Fig. 11. Neuropodial chæta of *Lepidonotus giganteus*, much magnified (cantera).

Fig. 12*a.* *pr.c.*, proximal half of a single notopodial hair.

Fig. 12*b.* *d.c.*, distal half of the same.

Fig. 13. Anterior end of the protruded pharynx, showing the circle of papillæ (*d*), the paired dorsal and ventral teeth (*b*), supported on the lateral cushions (*e*) of the lining of the pharynx. $\times 4$.

Fig. 14. The dorsal pair of teeth, seen *in situ*, after the retracted pharynx and buccal region have been slit open. $\times 4$.

<i>a</i> , the chitinous expanded base of the tooth.	<i>d</i> , prepharyngeal papillæ.
<i>b</i> , the claw-like terminal tooth.	<i>e</i> , cushion, between which and the base is a deep furrow.
<i>c</i> , secondary calcified junction across the dorsal line.	<i>f</i> , dorsal groove of pharynx.
	<i>g</i> , buccal region.

3. On a new Genus of Flat-fishes from New Zealand.

By H. M. KYLE, M.A., B.Sc., St. Andrews.¹

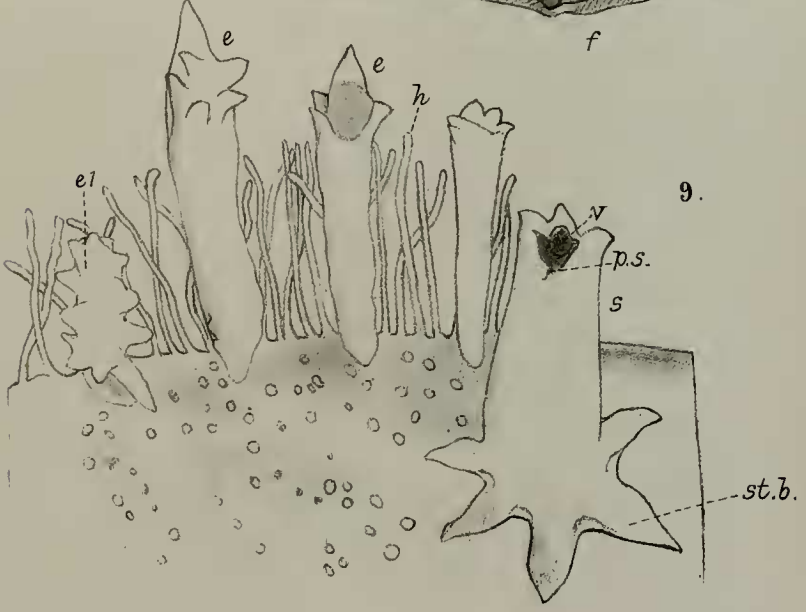
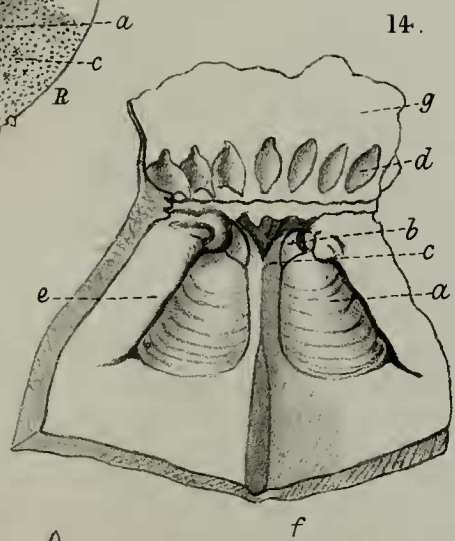
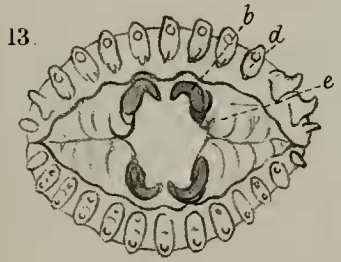
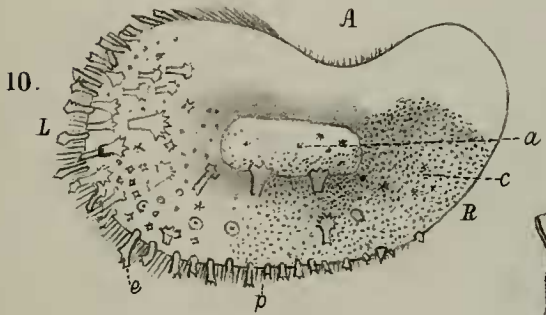
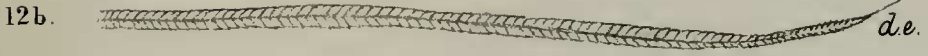
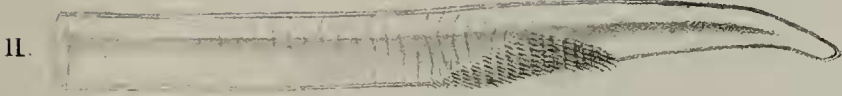
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The new genus of Flat-fishes which it is proposed to establish is founded on a single specimen contained in the collection of Prof. D'Arcy W. Thompson, C.B., of the University College, Dundee. It was presented by Prof. Jeffrey Parker of New Zealand, and had been labelled by him *Rhombosolea monopus*. A cursory glance, however, was sufficient to distinguish it from *Rhombosolea*; and a more careful examination and comparison with the description of the known and already described forms showed that it was different from them all, and merited a place in the classification of the Flat-fishes (*Heterosomata*) as a distinct genus.

It is somewhat precarious perhaps to found a new genus on a single specimen, but it would be absurd to suppose that this specimen was the only one of its kind. To describe this form at present, also, will lead to its earlier detection and differentiation from the other forms of the New Zealand fauna.

It is proposed to call this specimen *Apsetta thompsoni*, the generic term arising from its affinities, which are not with the

¹ Communicated by G. A. BOULENGER, F.R.S., F.Z.S.



LEPIDONOTUS GIGANTEUS.



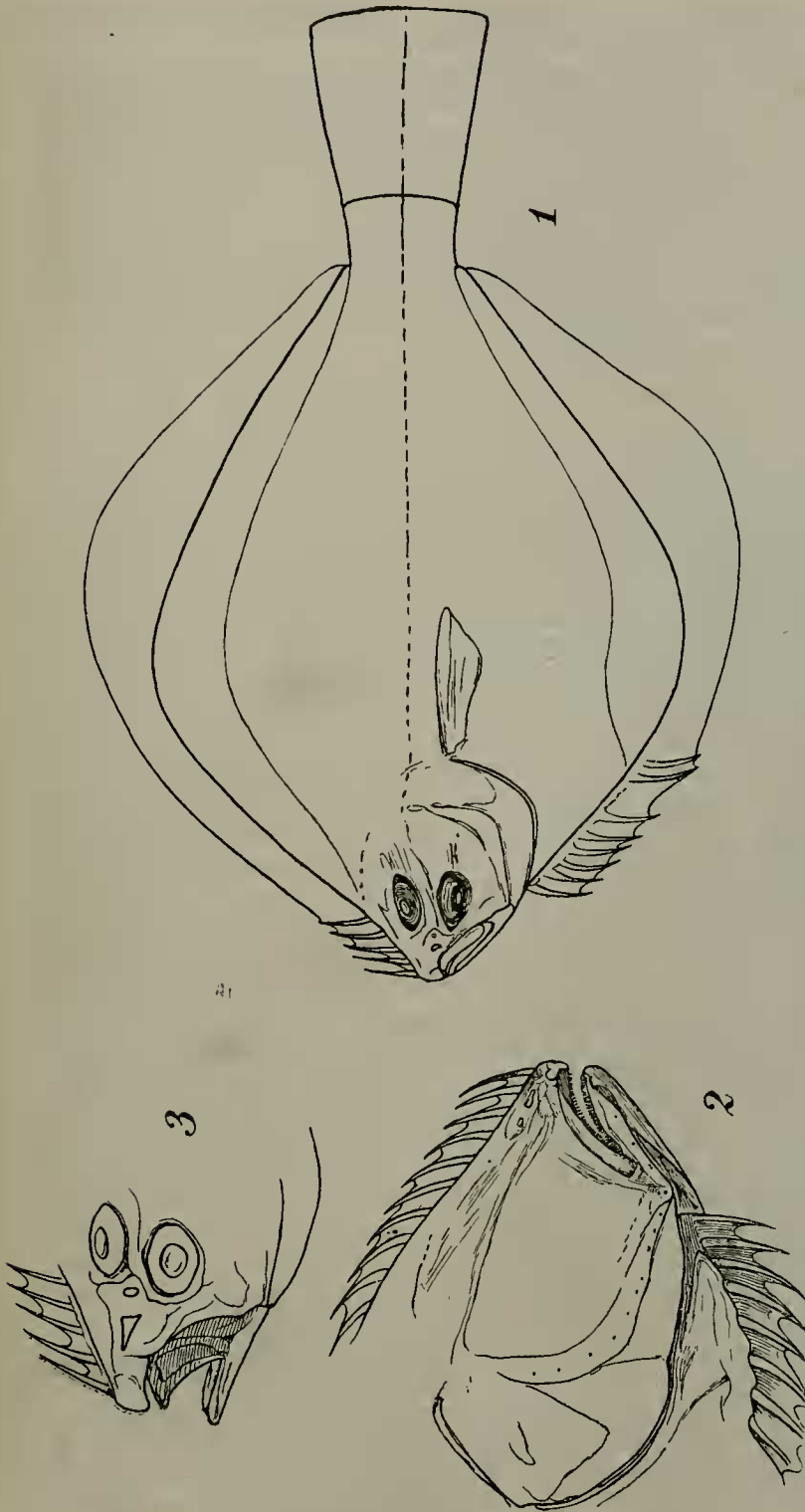


Fig. 1.—Outlines of *Apsetta thompsoni*.
Fig. 2.—*A. thompsoni*, under surface of head, showing the position of the ventral fins.
Fig. 3.—*A. thompsoni*, anterior part of head with mouth open.

H. M. K. ad nat. del.

Turbot group, and the specific term from the name of the naturalist who entrusted me with the specimen.

Characters.—Total length 21·8 cm. Total length without caudal fin 17·5 cm. Greatest height (without dorsal and anal fins) 68 per cent. of total length without caudal fin. Distance of greatest height from the beginning of the caudal fin-rays 57 per cent. of the same dimension. Length of caudal fin 24 per cent. do. Length and height of caudal peduncle 35 per cent. and 50 per cent. respectively of the length of the caudal fin. Distance of snout from base of pectoral fin 28 per cent. of total length without the caudal fin. Length of under ramus of the mandible 10 per cent. of the same dimension.

Br. 7. D. 55. A. 41. P. 10/10. V. 6/6. C. 2+7+7+2=18.
Vert. 10+19=29.

Eyes on the left side. Laminae of olfactory organ disposed longitudinally to the main axis of the body.

The form of the specimen described is rhomboid and somewhat similar to that of the Turbot (fig. 1, p. 987). Beginning at the snout the height increases rapidly until at a distance of one third the total length of the animal the greatest height of the body is attained. This greatest height is more than one half of the total length, or 68 per cent. of the total length minus the caudal fin. From this point the height of the body decreases sharply until at the base of the caudal peduncle it is only 10 per cent. of the total length. The relatively great height with the rapid decrease on each side of the line of greatest height gives the specimen a truncated appearance, and this is further increased by the peculiar disposition of the dorsal and anal fin-rays. The longest of these—25th to 29th dorsal, 15th to 20th anal—are posterior to the greatest height and almost halfway along the total length of the body.

The *dorsal fin* begins anteriorly on the snout, anterior to the maxillary bones. Owing to the greater convexity of the upper or eyed surface of the head, the fin-rays seem to arise more from the blind side. The first three rays are free at the ends. The rays are simple anteriorly, but about the 16th ray they become slightly bifid at the tip, and this condition increases posteriorly until at the hinder end each ray is spread out somewhat like a feather. The *anal fin* is similar, but the bifid rays begin with the fourth anteriorly. Posteriorly the dorsal and anal fins are distinct from the *caudal fin*, which is of a broad truncate form and not quite symmetrical. The *pectoral fin* of the eyed side is about 16 per cent. of the total length, that of the blind side somewhat less. The uppermost ray in each is simple, but the remainder are bifid and feathery at the tips. The *ventral fins* are similar in many ways to those of the Turbot. Both are prolonged anteriorly beyond the base of the clavicles: that of the eyed side lies along the ventral edge and is attached to the *urohyal* anteriorly; that of the blind side does not reach to the *urohyal* and is thus placed somewhat posteriorly to the other, its first ray lying between the

second and third of that of the eyed side. There are 6 rays in each, but the last ray of the ventral of the underside is very short and slender (fig. 2, p. 987).

The ventral fin of the eyed side begins under the gill-cover in a line with the middle of the eye. The extent of its base measured from the first to the sixth ray is 11 per cent. of the total length of the body. The rays are well separated one from another. This fin is joined on to the anal by a continuous membrane whose length along the base is a little less than half the base of the ventral. On the eyed side of this membrane, close to the first ray of the anal fin, is the small genital papilla; on the blind side is the anal opening. There is no projecting anal spine.

The body and head are covered with fine small cycloid scales, those on the head and anterior portion of the body having an oval or circular outline, those on the posterior caudal region being more oblong. With the exception of the caudal none of the fins are scaled, but on the caudal fin the scales extend over the base and between the rays. The *lateral line* is almost straight. Over the abdomen it gradually rises towards the otic region of the head, where it sends off the usual temporal branch and further forward the preopercular branch. It is more easily traced on the blind side of the head than on the eyed side, but even there the anterior branches are not very distinct. Immediately anterior to the nasal openings on the blind side, the most anterior pore of the lateral line can be clearly seen.

It is impossible to tell the original colour of the specimen, which has been in spirit for some years, and both the eyed and the blind side—the latter of which is usually of a light colour or even white in other flat-fishes—have now the same brownish hue. There do not seem to have been any distinct markings on the upper or eyed side, however, since some traces of these are to be seen ordinarily in spirit specimens.

The length of the *head*, measured from the snout to the extreme posterior margin of the opercular bone, is about 23 per cent. of the total length, or 28 per cent. of the total length minus the tail. It is therefore much shorter than the same relative proportions in many of the flat-fishes of the northern hemisphere, *e. g.* Plaice and Turbot, where they are 28 per cent. and 35 per cent. respectively, but it agrees with others, *e. g.* *Arnoglossus* and the Topknots. The upper and under margins of the head continue the outlines of the body, but are inclined somewhat anteriorly, so that the snout projects to a point. The lower eye is in advance of the upper, and both are on the left side. The interorbital space is about half as broad as the eye, and is marked by a moderately prominent ridge, which is continued backward over the head by a slight smooth eminence without tubercles. Anteriorly the interorbital ridge divides into two, forming the anterior boundaries of the eye-sockets. The lower eye is very close to the mouth, whilst the upper eye is about the same distance from the base of the dorsal fin. The contours of the preopercular bone can easily be

made out, and so can those of the subopercular, interopercular, and opercular bones, but not so readily.

The bones forming the *mouth* are much more developed on the blind than on the eyed side—the distances of the tip of the snout from the lower extremities of the premaxillary bones being in the proportion of 4 to 3, the greater being that of the blind side. Similarly, the proportion between the under and upper rami of the lower jaw is as 6 to 5. The under ramus (that of the blind side) is inclined backward from the mouth at a greater acute angle than the upper ramus, so that the latter overlaps the former. This can readily be seen from the under aspect (fig. 2, p. 987). The mouth thus asymmetrical like that of the Plaice group, is also small, the length of the premaxilla of the blind side being 24 per cent. of the length of the head measured from the snout to the posterior margin of the opercular bone. The posterior extremity of the mandible on the upperside is in a vertical line with the anterior extremity of the lower eye. There are no teeth on the upper or eyed aspect of the mouth, but on the lower aspect there are two rows of small sharply-pointed teeth on the mandible and premaxilla. These teeth are closely set and seem movable out and in, those of the premaxilla being more extended than those of the mandible. On the latter, the inner row stops about halfway, and a few teeth placed externally to the outer row continue the double series. There are no teeth on the maxillæ or vomer.

When the maxillæ and intermaxillæ are pulled outward, it is seen that they are overhung by a definite snout (fig. 3, p. 987) formed by the first interspinous ray, which is inclined forward from the anterior margin of the upper eye along the ridge of the head. The nasal organs lie one on each side of the dorsal fin as in the Turbot group: that of the eyed side lies between the interorbital ridge and the maxillary bones in the space between the latter bones and the ethmoid; that of the blind side lies immediately under the second and third rays of the dorsal fin (fig. 2). The posterior nostrils are simple, oval in outline, whilst the anterior are overhung by a triangular flap. The internal structure of the olfactory organ is similar to that of the Plaice group, *i. e.* the epithelial laminae, which are well-developed, are disposed longitudinally to the main axis of the body. There are no secretory sacs. The gill-opening is large and open. The gill-covers, though overlapping the margins of the pectoral arch and ventral fins, are free therefrom. The septum between the branchial cavities is unbroken. The gill-rakers are short, soft, denticulated, and very numerous, set in two rows on each arch, the outer row of the first arch on the eyed side having 29 rakers, the inner row of the same arch about 12. The pharyngeal teeth are small and pointed. The branchiostegal membranes meet but do not cross in the median line. The first three rays on the ceratohyal are slender, whilst the remaining four on the epihyal are long and well-developed.

The internal organs are similar in some respects to those of the Sole group. There are no pyloric cæca. Along the dorsal wall